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ポスター 4 : 11/26 AM1/AM2 (9:00-12:00)

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Mass analysis of low-energy ions originating from the lunar surface and exosphere: Feasibility study for MMX/MSA observations

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We analyzed ~1 year of the time-of-flight (TOF) data obtained from the Ion Mass Analyzer (IMA) on the Kaguya spacecraft to study the ion species originating from the lunar surface and exosphere. In this study, we especially investigated ion species coming from lunar highlands and lunar mare defined by iron abundance data obtained from the Gamma ray spectrometer on Lunar Prospector. At every time step of IMA observations, we calculated the motional electric field of the solar wind using the ion energy analyzer and the magnetometer and searched its footprint on the lunar surface. We divided the TOF data into two cases according to whether the footprint was in lunar highlands or in lunar mare. Integrating low-energy ions (<300 eV) of the TOF data, we identified C+, O+, and several metal ions such as Na+, Ti+, and Fe+. We found that these ions were more abundant in mare compared to highlands, which is consistent with other remote observations of the lunar surface. This indicates that with low-energy ion measurements we can study the elemental composition of the lunar surface. This technique will be used for future observations of Mass Spectrum Analyzer (MSA) on the Martian Moons eXploration (MMX) mission to study the Phobos surface.